

# The First Combat Aircraft

**On November 21<sup>st</sup> 1783, Jean-Francois Pilatre de Rozier was the first human to fly in a balloon. Soon countries were using balloons for both reconnaissance and bombing.**



Count Ferdinand von Zeppelin built the "Zeppelin balloon" after the Franco-Prussian War of 1870-1871.

## Balloons in the military

Balloons were used in combat for the first time during the French Revolution in 1794. A few officers went up in a balloon to study the Austrian forces. By the mid-19<sup>th</sup> century, other countries were also using balloons. In 1849, the Austrians launched the first aerial bombardment campaign against the Venetians. They set explosives on a timer and set them afloat in 200 unpowered hot-air balloons. The effort, however, failed miserably when winds blew the deadly balloons back to the Austrian side.





These silver Euros were minted as a dedication to the Aviation industry of Austria.

## The first military planes

In 1903, the **Wright Brothers** invented the first plane. Their success with the fixed wing aircraft resulted in the replacement of balloons by airplanes. Italy was the first to use planes in combat when they made survey flights to Libya during the Italian-Turkish war (September 1911-October 1912).

On November 1<sup>st</sup>, 1911, the Italians dropped the first ever bomb from an airplane, over Turkish military bases.

## Before the First World War

The build up to World War I saw the production of several innovative aircraft, some became outdated even before the war. One of them was the Rumpler Taube. The Rumpler was a German monoplane and the first to be mass-produced in the country. It was used as a fighter, bomber, reconnaissance and trainer aircraft. However, rapid developments in aviation technology made this plane obsolete by 1914.

Balloons were the first mechanisms used in air warfare. Their role was strictly recognised for investigation purposes.





# World War I Fighters

In the first few months of World War I, planes were mainly being used for reconnaissance. But things changed in August 1914 when Allied and German pilots started shooting at each other with pistols and rifles.

## A well placed solution

While the need to arm aircraft with guns was established, designers struggled with the right place to fix these. French engineer Raymond Saulnier solved this problem by developing a synchronising gear that regulated the gun so the bullets passed between the propeller blades. In December 1914, the French aviator Roland Garros installed this on his aircraft. Garros was shot down on 18<sup>th</sup> April, 1915 and his airplane was captured by the Germans.



## The Fokker Eindecker

The Germans reacted quickly, putting the Dutch aviation engineer Anthony Fokker to work. Fokker designed an efficient interrupter gear, which he fitted onto a monoplane of his own design. The result was the Fokker Eindecker entered service in July 1915. The Eindecker reigned supreme in the air over the Western Front until October 1916—a period known among Allied aviators as the “Fokker Scourge.”

## Allied fighters

In 1916, France introduced the Nieuport 17, and Britain its first fighter, the Sopwith 1½ Strutter. Both were inspired by a Fokker plane that was forced to land in enemy territory due to fog. The French and the British conducted detailed studies of the captured plane and developed better combat aircraft.

The Nieuport 17, a biplane fighter had a powerful engine and large wings.



▲ The Fokker Eindecker granted the Germans air force almost complete supremacy from July 1915 until early 1916. This period was known as the Fokker Scourge during which Allied aviators regarded themselves as “Fokker fodder.”



# The Fight Intensifies


**By the summer of 1916, the allied aircraft had total control of the air. The Germans were helpless against the combined strength of the Sopwith Strutter and the Nieuport.**

## The Albatros

The Germans needed to re-establish their air superiority. They ordered the Albatros Company and the result was the impressive Albatros D.I. Unlike other fighters at the time, the aircraft had great strength and rigidity. Oswald Boelke, the famous German combat pilot, formed hunting squadrons, known as Jastas.







The Sopwith Camel arrived in 1917 and helped Britain to reclaim the skies over Germany's Albatros.

The Sopwith Camel was a British World War I single-seat fighter biplane, famous for its manoeuvrability.

## Bloody April

By April 1917, 37 Jastas were in service and had established German air superiority on the Western Front. In fact 'Bloody April' is still regarded as the most disastrous time in the history of British military aviation. The British had over 300 aircraft but were over-powered by the Jastas and their fleet of 100 aircraft. The Royal Flying Corp lost over 240 aircraft and more than 200 men were killed during this period.

## Sopwith Camel

In retaliation, Britain started training its pilots on the new Sopwith F.1 Camel, in a bid to regain control of the skies. The Camel, who got its name because of the humped fairing over its twin machine guns, was an agile, highly manoeuvrable biplane. By the end of 1917, the British had succeeded in their plan. The Camel destroyed 1,294 enemy aircraft, more aerial than any other Allied aircraft during World War I, and effectively ended German's aerial supremacy.





# World War I Bombers

The first genuine bomber used in combat was the French "Voisin" airplane, which bombed the Zeppelin hangers at Metz-Frascaty. However, their success was more because of the highly flammable zeppelins themselves.



## Slower to develop

Specialised bombers developed at a slower pace than fighters. This was because bombers had to be able to carry heavy disposable loads over long distances. Britain's first bomber was the Handley Page H.P. O/100, which flew for the first time in December 1915. Other air forces also began building bombers.

▲ Handley Page H.P.O/100 was the World War I bomber.





The Gotha G.V. bomber was strong enough to carry more than 454 kilograms of bombs.

### Early leaders

The Ilya Mourametz was introduced into the Imperial Russian Air Service around the same time. The world's first four-engine airplane, the Ilya Mourametz first flew on May 13, 1913. About 80 of them were built, and they made 400 raids on German targets with the loss of only one plane.

### German bombers

The Germans were not to be left far behind! Their most successful bomber was the twin-engine Gotha biplane. On May 1917, a fleet of 21 Gothas appeared over the English coastal town of Folkestone killing over 95 people. In June 1917 they created even more destruction over London killing 162 people. From mid-September the Gothas were joined by an even larger, more potent bomber, the Zeppelin-Staaken Riesenflugzeug "Giant" which could carry up to 1,814 kg of bombs.



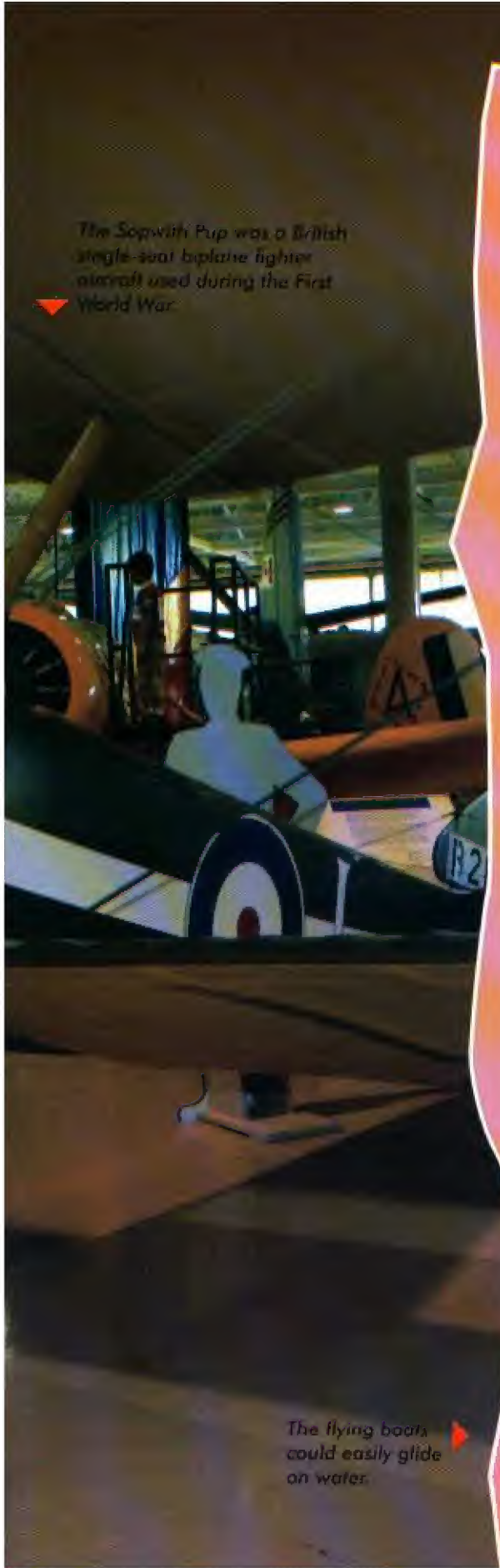
# Naval Aviation

During World War I three different types of naval aircraft evolved : the long-range over-water reconnaissance and anti-submarine aircraft, the shorter range floatplanes, and ship-borne aircraft.

## The flying boat

The most efficient of the long-range airplanes were the large, twin-engine "flying boats" designed by Glenn Curtis and others. They were called flying boats because they were shaped like the hull of a boat. Despite their bulk, these aircraft were fast and manoeuvrable enough to engage enemy aircraft in combat. Curtis' flying boats were the only aircraft of U.S. designed to be on combat duty in World War I.





The Sopwith Pup was a British single-seat biplane fighter aircraft used during the First World War.


## The birth of the carrier

Carrier-based air power also advanced rapidly. In early 1916 the first landplanes (British Sopwith Pups) were flown off the 200-foot decks of primitive carriers that had been converted from merchant ships. On August 2, 1917, a pilot landed a Pup on the takeoff deck of HMS Furious. With this the concept of the true aircraft carrier was born!

## Transport and training

Transport aircraft design did not develop much during this period. These aircraft were mainly used to drop supplies for forces that had been cut off. People would drop bags of food, medical supplies, or ammunition from bomb racks.

On the other hand, training advanced in leaps and bounds. At the RFC School of Special Flying at Gosport, England, Major Robert Smith-Barry introduced a curriculum that combined academic classroom training and flight instruction. This system was eventually adopted at training schools throughout the world.



The flying boats could easily glide on water.



# Interwar Developments

In the two decades between the two World Wars, the biggest development in the military aviation was the replacement of wooden frames with metal in aircraft.

*The Supermarine Spitfire, a British single-seat fighter aircraft was the only Allied fighter in production throughout the Second World War.*

## All metal monsters

By 1939, the most important combat aircraft were all-metal monoplanes that had retractable landing gear. Their engines could generate 1,000 **horsepower** or more and could fly at altitudes above 30,000 feet. Better flight instruments and electrical cockpit lighting allowed pilots to fly at night and in bad weather. These aircraft had enclosed cockpits so the crews were more comfortable.


## Fighters

The first of the new fighters to be put into service was the Soviet I-16, designed by Nikolay Polikarpov. The aircraft was very successful against German and Italian planes in the Spanish Civil War of 1936–39. Meanwhile, the German **Luftwaffe** (German term for air force) was arming itself with the first version of the Bf 109, designed by Willy Messerschmitt.



## Bombers

Bombers also changed to high-strength metal construction in the late 1920s. The single wing design that emerged in the early 1930s brought higher speeds. The most famous of these was the B-17 Flying Fortress. This plane was designed to penetrate any target in daylight as long as it had sufficient defensive armament to battle past opposition. Another important development was the dive-bomber, designed to release its bombs at a low point of a steep dive. The most famous was the German Ju 87 "Stuka," which gained a fearsome reputation for its destructiveness.



The Boeing B-17 Flying Fortress, a four-engine heavy bomber aircraft was developed for the United States Army Air Corps.



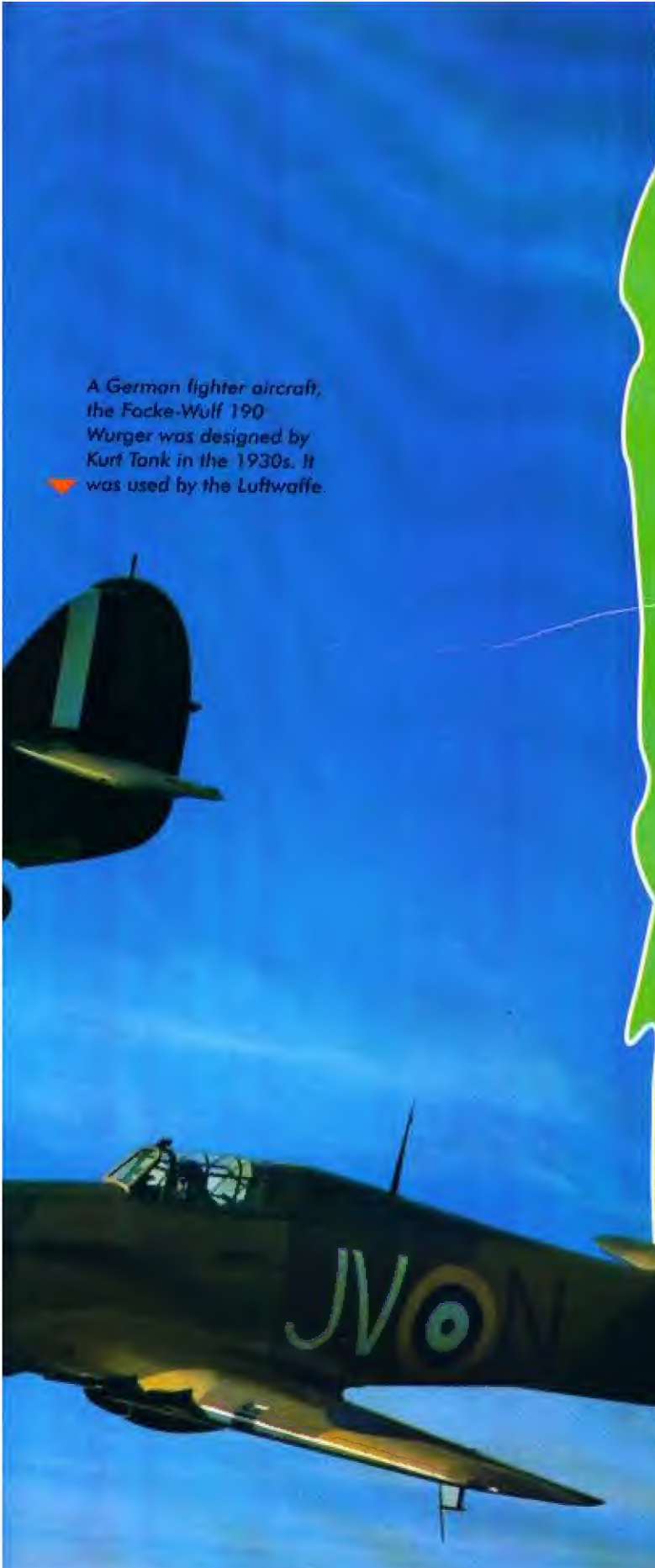
# World War II

During World War II German forces used the tactic of sudden attacks. This tactic was called **Blitzkrieg**, meaning "lightning war." The speed and size of the German fighters made them particularly effective at this tactic.

## The Luftwaffe

In the early years of the war, the Messerschmitt Bf110, a twin-engine heavy fighter was the Luftwaffe's main night fighter. These formidable fighters helped spread terror across the skies of Europe with their superior range and firepower. They were however almost useless in the daytime and performed badly during the **Battle of Britain**. Other Luftwaffe fighters included the Messerschmitt Me 262, the first jet engine fighter, the Focke Wulf Fw 190 and the Heinkel He 162.





A German fighter aircraft, the Focke-Wulf 190 Wurger was designed by Kurt Tank in the 1930s. It was used by the Luftwaffe.

## The Battle of Britain

The initial success of the German Luftwaffe made them overconfident. In 1940, the Royal Air Force of Britain took on the Luftwaffe with a total of about 700 fighters, including 32 Hawker Hurricane squadrons and 19 Spitfire squadrons. The Germans had over 2,500 bombers and fighters. Despite the overwhelming numbers of the enemy aircraft, the British forces prevailed. This was a major turning point in the war.

## Other European fighters

Other European nations did not have huge air forces. However, aircraft such as the French Dewoitine D.520 contributed towards the war effort. The Dewoitine D.520 entered service in early 1940 and was a close match to the latest German fighters, such as the Messerschmitt Bf 109. However, because of a delayed production, only a small number were available. Other allied fighters included the Italian Macchi C.202, the Russian Mig-3 and Lavochkin La-5.



# World War II Bombers


**Bombers were the ultimate long-range weapons of World War II. They bypassed the enemy's army, navy and natural barriers, and rained down destruction on the enemy.**



## **British supremacy**

Britain had some of the best bombers at its service including the Avro Lancaster and the de Havilland Mosquito. Lancasters flew and dropped 608,612 tonnes of bombs between 1942 and 1945. A famous Lancaster bombing raid was the 1943 mission, codenamed Operation Chastise, to destroy the dams of the Ruhr Valley in Germany. The Mosquito was a light and speedy aircraft useful as a day or a night fighter.





The German Junker aircraft is significant because it was the first aircraft to utilise an all-metal "total structural" design. ▶

### German bombers


The Junkers (Ju) were the mainstay of the German bomber lineup. The Ju 88 was a medium range bomber that could carry a great deal of ammunition. It was also an excellent night fighter.

The Heinkel 111, a medium range bomber was also used until the end of the war.

The Heinkel was especially effective during the first phase of the London blitz. Yet another frequently used aircraft of the Germans was the Junkers Ju 87 Stuka dive bomber.

### Other bombers

Russia's best bomber was the Petlyakov 2, something between the British Mosquito and the German Stuka. It was a fast and agile medium range dive-bomber, carrying up to 1.2 tonnes of bombs. The Ilyushin 4 was Russia's main long-range bomber. It bombed Berlin, East Germany, and the vast German-occupied territory in Eastern Europe and Russia.



▶ The Avro Lancaster a World War II bomber aircraft was also known as "Lanc" or "Lankie".



# The Jet Age


**The first jet powered combat aircraft was the Messerschmitt ME 262 built during the World War II. After the war, the British took the lead and had, within a few years, several jet fighters, two naval jets and even a jet-powered sea plane.**

*Although it was not used in combat, the Sea Vampire served with front line RAF squadrons until 1955.*

## Initial lead

Britain was the only allied power to have a jet fighter squadron before the end of the war. The Gloster Meteors of the Royal Air Force defended Britain from German bombs. Britain also introduced the single engine, de Havilland DH-100 Vampire in 1946. The Sea Vampire was the first jet aircraft to operate from an aircraft carrier. Apart from developing several other jet aircraft, the British also built a single-seat jet seaplane called the 'Squirt' that never took to the air.





## American efforts

The United States entered the jet age in 1942 with their Bell XP-59. This fighter was never used in combat. The first American jet fighter to see action was the Lockheed P-80 Shooting Star, which was used extensively in the **Korean War**. The most successful combat aircraft of the jet age to serve in the Korean War was the F-86A Sabre.

## Russian response

Russia was quick to realise that it would need to enter the jet age. Four design teams took up the challenge to produce the first Russian jet combat aircraft. Two of them came up with prototypes within six months. On April 24 1946, Artem Mikoyan and Mikhail Gurevich won the contest and their MiG-9 became the first Russian jet to fly. It was followed by the Yakovlev Yak-15.



# Super Sonic Combat Aircraft

**After the jet age, the next challenge facing the air forces was to get the aircraft to fly at speeds faster than sound. Guided missiles were also first developed during this time. The supersonic aircraft brought in the speed and the ability to gain height rapidly.**

*The Sukhoi Su-27 is a single-seat Mach-2 class jet fighter plane.*





*The Sukhoi Su-27 was intended as a direct competitor for the large American fourth generation fighters.*



## **Breaking the sound barrier**

The F-100 Super Sabre was the first U.S. fighter capable of supersonic speed. It broke the sound barrier on its first flight and set a speed record in October 1953 at 1,215 km/h. The Super Sabre, especially its F-100D variant, was widely used in the Vietnam War.

## **Improved designs**

Achieving speeds faster than sound was just the first step towards a new generation of fighters. Aircraft designers had to improve performance and efficiency to cope with the challenges of the modern world. Swing-wings were developed to reduce friction and increase speed. This innovation helped an aircraft to sweep its wings back during high speeds and bring it back to normal position at normal speeds.

## **New age controls**

Increased speeds naturally led to the development of super light aircraft. Weapons were made lighter and lightweight metal alloys were used to build these fighters. Another significant change came with fly-by-wire control systems. These systems used computers to control the aircraft, thereby getting rid of heavy cables. Modern fighters also have light and responsive controls which make them more agile and easy to manoeuvre.





# Super Sonic Bombers

**After Supersonic fighters it was the turn of the bombers to fly faster than the speed of sound.**



## **B-58 Hustler**

The Hustler was a revolutionary bomber. One of its unique features was a tailless delta wing that helped the aircraft reduce friction. The wing also enabled the aircraft to achieve high speeds even at low altitudes. Another amazing feature of the B-58 was its ejection capsule, which made it possible for the aircraft crew to eject out of the bomber even while travelling at high speeds.

▲ The B-1 Lancer was first used as a supersonic bomber in the 1960s by the United States Air Force.



## Other American bombers

The B-1 Lancer is the backbone of the long-range bomber force of the U.S. Air Force. It has been used in several successful operations led by the U.S. including the ones in Iraq, Kosovo and Afghanistan.

## Soviet bombers

The Tupolev Tu-22M has wings, which can be swept back when flying at supersonic speeds. The Soviets used this bomber extensively in Afghanistan for carpet-bombing. The most successful bomber, however, in the Soviet arsenal is the Tupolev Tu-160. This bomber resembles the American B-1 Lancer but is much larger and faster.

*The Tupolev Tu-22M, also known as "Backfire" by NATO is a supersonic long-range strategic and maritime strike bomber.*





# Modern Combat Aircraft

The latest developments in the modern warfare are plexiglass cockpits, thrust vectoring, supercruising, stealth technology and the use of lightweight materials.



## Super cruise

Most **supersonic aircraft** use afterburners to overcome the sound barrier. Fuel is injected into the exhaust of the aircraft to get additional thrust. Afterburners use up a lot of fuel and reduce the flying time. Supercruising aircraft can fly faster than the speed of sound without using afterburners. All modern combat aircraft, like the Eurofighter Typhoon and the F-22 Raptor are supercruisers.

▲ The Lockheed F-117 Nighthawk is a stealth ground attack aircraft formerly operated by the United States Air Force.





▲ Sukhoi Su-30 MKI has satellite navigation system that allows it to fly in any kind of weather.

## Stealth

The first combat aircraft to use stealth technology was Lockheed Martin's F-117 Nighthawk. Stealth aircraft are made from materials that absorb radar signals. Moreover, the aircraft's design is such that any signals that are reflected, move away from the radar. Thus, the aircraft is invisible to radar. Stealth combat aircraft are expected to play a very important role in future conflicts.

## Heads up screen display

Earlier combat aircraft had cockpits that were crammed with dozens of dials and gauges. Modern aircraft have just a few computer-controlled displays. The most important development is the heads up display (HUD). Critical information is projected on a screen in front of the pilot. This enables the pilot to track and shoot down aircraft without taking his eyes off it.



▲ The McDonnell Douglas (now Boeing) F-15 Eagle is a twin-engine, all-weather fighter. It is one of the most recognised fighters of the modern day.



# Naval Combat Aircraft

**Naval Aviation began in 1912 when, for the first time an aircraft took off from the British ship, HMS Hibernia. Today naval aviation stands shoulder to shoulder with its air force counterpart.**

## Carrier-based aircraft

Aircraft carriers are very large, but even so it is not easy to take off or land a plane on a ship, especially if it is moving. Carrier-based combat aircraft are usually small with foldable wings, as there is a lack of space on carriers. They take off in the direction the ship is sailing and land from the rear. Some carriers have a steam-powered catapult that pushes the aircraft forward with force, allowing it to take off quickly.

*The AV-8B harrier 11 is primarily used for light attack, typically operated from small aircraft carriers and large amphibious assault ships.*





V-22 Osprey is a military tiltrotor aircraft that has the VTOL feature.

### Modern carrier aircraft

Vertical Take Off and Landing (VTOL) reduces the risk of taking off or landing on ships. With VTOL, combat aircraft can lift up without taxing, much like a helicopter. Aircraft are able to do this using the thrust vector technology which allows them to direct thrust from the main engines in any direction.

### Ski jump ramps

The biggest drawback of VTOL aircraft is that they cannot carry a great deal of weight. Ski jump runways provide the perfect solution to this problem. In this case, combat aircraft can take off normally without catapults as these short runways provide necessary power.





# Combat Helicopters

**Helicopters were first introduced to combat in World War II. It was not until the mid-1950s that helicopters were actually evaluated as combat platforms that could carry weapons.**

*The UH-1 has long become a symbol of U.S. involvement in Southeast Asia. It has become one of the world's most recognised helicopters.*



## First experiments

In the mid-1950s, Colonel Jay Vanderpool of the U.S. Air Force, armed a few rag tag with machine guns and had his pilots attack various targets. At the time his efforts were ridiculed by people who thought that helicopters were too slow. Army leaders, however, felt that these helicopters could be used for air support. Armed helicopters were first used during the Vietnam War in the fall of 1962.



## Enter, the Cobra

Based on the Army's requirement, Bell Aircraft started to develop a helicopter gunship. Bell fitted the Huey engine, transmission, and avionics to a slender body. The helicopter was equipped with a machine gun, a grenade launcher, rockets, and later, anti-tank missiles. The highly effective AH-1G HueyCobra was born and entered the U.S. Army and the U.S. Marine Corps.

## Sky Crane helicopters

Transporting troops and equipment was a major concern for the U.S. Army. So it commissioned the development of a special helicopter. The result was the CH-54 Tarhe designed by Sikorsky Aircraft. The helicopter could lift several tonnes at a time.

The Boeing CH-47 Chinook is a versatile, twin-engine heavy-lift helicopter. Its top speed of 315 km/h was faster than other attack helicopters of the 1960s.





# Attack Helicopters

**The next generation of attack helicopters was the AH-64 Apache, developed by Hughes. An Apache was the first allied aircraft to open fire during the 1991 Persian Gulf War.**

*The Mi 24 hind is a large helicopter gunship and low-capacity troop transport produced by the Mil Moscow Helicopter Plant and operated first by the Soviet Air Force.*

## **Russian efforts**

The Soviet Union developed its own unique assault helicopter, the Mi-24 Hind. Unlike American helicopters, the Hind is not simply a weapons platform, but can also carry troops. Hinds operated extensively in Afghanistan and were a primary target for U.S.-made Stinger anti-aircraft missiles.





▲ The MH-60G Pave Hawk's primary mission is insertion and recovery of special operations personnel.

The AH-64 Apache is an all-weather day-night military attack helicopter with a four-bladed main and tail rotor and a crew of two pilots who sit in tandem.



## The British and the French

The rest of the world was not far behind. The British had their Westland Lynx. It is used both by the Army Air Corps and the Royal Navy's Fleet Air Arm. Westland's Sea King and Commando have the longest range amongst all combat helicopters. The French anti-tank helicopter Sa 341 Gazelle is one of the fastest combat helicopters.

## Global momentum

Many countries did not have dedicated assault helicopters and chose to arm existing helicopters with anti-tank missiles or rocket launchers. These modifications had drawbacks and prompted many countries to develop their own helicopter gunship programs. The Russians developed their own versions of the Apache, the Mi-28 Havoc and Ka-50 Werewolf. Italy developed its own anti-tank helicopter, the A.109 Mangusta. In 1988, a consortium of European companies, known as Eurocopter, began developing its own combat helicopter, the Tiger.



# Unmanned Combat Aircraft

Unmanned air vehicles (UAV) were used for reconnaissance in the Second World War. These days they are even used for active combat missions.

## First unmanned vehicle

In the 1970s the U.S. Air Force seriously experimented with UAVs. The objective was to destroy enemy anti-aircraft gun and missile sites by using UAVs. The results were good enough to permit the production of the BGM-34B. The concept, however, failed to take off and the project was shelved. Interest was rekindled in the summer of 2003.

The MQ-1 Predator is an unmanned aerial vehicle (UAV) of the United States Air Force. It can serve in a reconnaissance role and fire two AGM-114 Hellfire missiles.








## U.S. Joint Unmanned Combat Air System (J-UCAS)

In 2003, the U.S. Army and Navy joined together to form the Joint Unmanned Combat Air System (J-UCAS) program. The objective was to develop a viable UCAV. Under the direction of the J-UCAS, Boeing developed the X-45A unmanned combat aircraft. The aircraft made history in April 2004 by releasing a non-explosive Global Positioning System-guided Small Smart Bomb and hitting a ground target. The Defense Advanced Research Projects Agency (DARPA) has also awarded Northrop Grumman a contract to develop its X-47B unmanned combat aircraft.

## International Efforts

The U.S. is not alone in its efforts to develop UCAVs. The British displayed a concept UCAV designated "Proteus," while the Swedish government has worked with the SAAB company for its studies on a UCAV.



▲ This North-American F-18 flies with the Boeing X-45A, an unmanned combat air vehicle.

▲ The Boeing X-45 is an unmanned combat air vehicle.



# The Indian Air Force

The Indian Air Force was formed on 1<sup>st</sup> April 1933, when the 1<sup>st</sup> Squadron came into existence. Today, it is the fourth largest Air Force in the world .

## India in the Second World War

During World War II, the IAF aligned with U.K. It played a key role in stopping the advance of the Japanese in Burma. Its first air strike was on a Japanese military base in Arakan. It also carried out strike missions against the Japanese airbases at Mae Hong Son, Chiang Mai and Chiang Rai in northern Thailand. For its efforts, the prefix 'royal' was added before its name in 1945. The name was changed again to Indian Air Force in 1950 when India became a republic.



The Suryakant Ambastha Team (SAAT) was formed in 1996 to serve as the "Ambassadors of the Indian Air Force". The team has since performed numerous demonstrations in various parts of the country and abroad.



The Mi-17 is a multi-role helicopter that can also be very heavily armed with an extensive array of rockets, missiles and guns.



## Indo-Pak Wars

Between 1955 and 1971, the Indian Air Force entered a new era with the acquisition of jet aircraft. This period also saw the two **Indo-Pakistan wars**. In both these wars the IAF effectively neutralised the Pakistani Air force. The IAF also helped in the peace-keeping efforts of the UN in the Congo.

## A period of development

Over the next two decades IAF upgraded its aircraft and equipment on a massive scale. Over 20 new aircraft were introduced including the Jaguar and several variations of the MiG. The MiG is a revolutionary aircraft that operates up to three times the speed of sound and over 80,000 feet above sea level. The IAF also broke several records in this period. Sqn Ldr Makkar and Flt Lt RTS Chinna set a world record by bombing from their Mi-17 helicopter in Ladakh at an altitude of 5050 metres. Sqn Ldr Sanjay Thapar, was the first Indian to para jump over the South Pole.



# Fighters Of The Indian Air Force

**The Indian Air Force has over 1430 combat aircraft. Most of the fighter jets are of foreign origin.**

*The Mirage 2000 is a French-built multi-role fighter jet manufactured by Dassault Aviation. It evolved into a successful multi-role aircraft and now used as IAF's ground-attack fighter.*

## Fighters

The IAF possesses several multi-role fighter jets. The Sukhoi Su-30MKI is the main fighter. The aircraft is a twin seater, multi-role fighter that has a maximum speed of 2500 km/h (Mach 2.35) and can fly at a height of 20,000 metres.





The Mikoyan MiG-29, is a fourth generation jet fighter aircraft designed in the Soviet Union. It can reach a top speed of 2,445 km/h.

### **Mirages and MiGs**

Other effective fighters in the IAF include the single-seat Mirage 2000s and MiG-29s. Both are very effective as both attack and defence aircraft. The MiG-29 has a top speed of 2,445 km/h (Mach 2.3) and is armed with a 30 mm cannon along with R-60 & R-27 R missiles. Four hundred and fifty multi-role MiG-21 combat aircraft have been serving the IAF for the past two decades. The Mirage 2000-H, on the other hand, is capable of flying at 2,500 km/h (Mach 2.3) and is the IAF's prime ground-attack fighter.

### **Strike and Attack Aircraft**

India's primary ground strike force consists of squadrons of Jaguar IS and MiG-27 aircraft. The IAF has 100 Jaguar IS and 8 maritime strike Jaguar IM aircraft.



# Reconnaissance

**During the Kargil War, the IAF was dependent on the English Electric Canberra aircraft for reconnaissance.**

## Eyes in the sky

India has purchased a Phalcon airborne radar plane from Israel. This was one of six such aircraft that have been ordered by India. In addition, India's Centre for Airborne Systems (CABS), is working to develop an indigenous airborne warning system. This will consist of an indigenous radar and control system mounted on a Brazilian Embraer EMB-145 regional jet.

The MiG-21 and the MiG-25 are supersonic jet fighter aircraft, designed and built by the Mikoyan-Gurevich Design Bureau.







▲ The HAL Dhruv helicopter was developed and manufactured by India's Hindustan Aeronautics Limited (HAL).

## Military transport

The IAF operates 25 Ilyushin Il-76 for military transport duties such as tactical and strategic airlift, at all operational levels. The Il-76 MD is a strategic airlifter and has a range of over 5,000 km. In 2003, the IAF also purchased 6 IL-78MKI aircraft from Russia which were fitted with ARP-3 aerial refuelling pods from Israel.

## Helicopters

An important objective of the IAF is to support ground troops by providing air-cover and by transporting men and essential commodities across the battlefield. For this purpose the IAF uses helicopters such as the Mi-25/35, Mi-26, and the HAL Dhruv. The IAF uses the MI-35 and a modified MI-17 as its main attack helicopter. However, India has plans to replace these aging machines.





# Combat Aircraft Of The Future

The future belongs to multi-role combat aircraft with all the features of present fighters and more. Some new generations aircraft with extraordinary agility and dogfight abilities include the F-22 Raptor, Joint Strike Fighter, Rafale and Eurofighter Typhoon.



The F-22 Raptor is a fifth-generation fighter aircraft. It is a multi-role combat aircraft.

## Face of the future

The F-22 Raptor of the U.S. Air Force is the face of the future of combat aircraft. This fighter aircraft uses stealth technology. It is a superior air fighter with multiple capabilities that include ground attack, electronic warfare, and signals intelligence roles. Its most outstanding feature is its unique radar that can track several targets even in the worst weather conditions.





## Joint Strike Fighter

The F-35 Joint Strike Fighter (JSF) is currently being developed jointly by the United States, Britain and many other partner nations. It is a single-seat, single-engine, stealth-capable military strike fighter. A multi-role aircraft, it can perform close air support, tactical bombing, and air superiority fighter missions. The F-35 has three different models; one is the conventional takeoff and landing variant, the second is short takeoff and vertical-landing variant, and the third is a carrier-based variant.

## European effort

The most well-known European combat aircraft projects are the Eurofighter and the Rafale. Following the current trend of multi-role strike fighters, Britain, Germany, Italy and Spain jointly developed the Eurofighter Typhoon. It combines agility, stealth technology and performance making it the best fighter aircraft, second only to the Raptor.

▲ The Lockheed Martin F-35 Lightning II can perform close air support, tactical bombing, and air defense missions.



▲ The Eurofighter Typhoon is a twin-engine canard-delta wing multi-role aircraft.



## **Glossary**

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**Battle of Britain:** attack of the German airforce on Britain during World War II

**horsepower:** unit of power

**Indo-Pakistan War:** war between India and Pakistan

**jet:** aeroplane powered by one or more jet engines

**Korean War:** war between North Korea and South Korea, where the U.S. and the United Nations helped South Korea

**lightning war:** form of military attack popularised by the Germans

**Luftwaffe:** the German airforce

**MIG:** series of Russian fighter aircraft

**reconnaissance:** an examination of a territory, or of an enemy's position, for the purpose of obtaining information necessary for military operations

**supersonic aircraft:** aircraft with a speed greater than sound

**World War:** war where major nations of the world are involved; there have been two World Wars till date

**Wright brothers:** first people to invent and fly an aeroplane

**zeppelin:** large air vehicle that was used during World War I to carry bombs



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